Reorientation of Shipyards: Opportunities in Offshore Energy

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Steve Robertson

History and Office Locations

• Established 1990
• Aberdeen, Canterbury, London, Houston, New York & Singapore

Activities & Service Lines

• Business strategy & advisory
• Commercial due-diligence
• Market research & analysis
• Published market studies

Large, Diversified Client Base

• >1000 projects, >400 clients,
  >70 countries
• Leading global corporates
• Energy majors and their suppliers
• Investment banks & PE firms
• Government agencies

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Energy demand is the principle indicator of energy-related spend including offshore installations, which in turn drive demand for offshore vessels.

Rapid demand growth since 1990 has been a major driver of a higher oil & gas price environment during this time, which has subsequently led to the viability of complex subsea/deepwater projects.

The increase in global energy consumption will be led largely by China given the country’s industrial sector.

The oil industry is mature and generally considered to be struggling to keep up with demand and offset natural decline.

DW expects shallow water production to continue to account for the majority of oil supply. Deepwater production is however projected to grow at a higher rate.

The global gas industry is less mature and as such significant new capacity additions are expected over the next ten years.
• Weakened demand from Europe and Asia, coupled with significant supply contributions from countries such as the US and Libya, will likely cause prices to fluctuate between $70 – 80 per barrel in the ST.

• DW expect oil prices to fluctuate between $70 – 80 throughout 2015. Notably, significant production decline from the US and KSA could place upward pressure on pricing.

• Recovery from Asian and European economies presents some upside potential; however, Japan’s recent dip into recession suggests this is unlikely in the short-term.

• Government budgets vary depending on oil price expectations – most countries rely on oil price being above $90. However, sovereign wealth funds should serve to offset low oil prices in the short-term.

• KSA will not want to be the swing producer and lose valuable market share. Saudi net exports: $360bn at $115 oil, $270bn at $85 oil.

• OPEC are unlikely to cut production – supported by recent production agreements between key member states and Asia (i.e. KSA and Kuwait).

*excludes Venezuela – fund no longer available
Gas prices are substantially more regionalised compared to oil and massive recent US shale gas production has seen major variance with HH trading at a 75% discount compared to Japan-bound LNG.

Asia’s high price tolerance has been a major enabler for highly Capex-intensive Australian export projects in recent years, however the potential to ship cheap US gas via LNG could create substantial arbitrage and threaten higher cost export projects.

A reduction in E&P spend by oil companies (or Capex compression) is a major threat to projected levels of offshore vessel demand.

Since 2000 industry costs have increased dramatically which has impacted project profitability despite an all time high oil price environment.

Rising costs have been blamed on supply chain constraints, increased project complexity and a lack of standardisation.

Cost escalation has been one of the key reasons for high project deferments by Chevron, Statoil and Shell in recent years.
Offshore Wind accounts for the largest proportion of offshore renewable energy supply and is driven by both political and economic factors.

- Political drivers include globally agreed regulations, such as the Kyoto protocol, and various regional and national measures are being undertaken in order to directly cut or cap greenhouse gas emissions.
- The offshore renewables market is highly reliant on government subsidies due to the high capital cost involved.

Macro-Economic Renewables

<table>
<thead>
<tr>
<th>Annual Added Capacity</th>
<th>Increasing Project Size, Depth and Distance from Shore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave &amp; Tidal</td>
<td>0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 26.0 28.0 30.0 32.0 34.0 36.0 38.0 40.0</td>
</tr>
<tr>
<td>Offshore Wind</td>
<td>0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0 110.0 120.0 130.0 140.0 150.0 160.0 170.0 180.0 190.0 200.0 210.0 220.0 230.0 240.0 250.0 260.0 270.0 280.0 290.0 300.0 310.0 320.0 330.0 340.0 350.0 360.0 370.0 380.0 390.0 400.0</td>
</tr>
</tbody>
</table>

Timeline 2000-2020:
- 2000: 57 MW
- 2002: 64 MW
- 2004: 49 MW
- 2006: 124 MW
- 2008: 145 MW
- 2010: 329 MW

Agenda
Macro-Economic Environment
Lifecycle, Definitions & Local Content
Market Outlook
Market Overview
Conclusions
**Oil & Gas Lifecycle**

1. **Exploration & Appraisal**: Exploration & appraisal services are used to determine the existence of oil & gas reserves and the economic viability of their development.

2. **Drilling**: Once a development plan has been confirmed, offshore development wells are drilled and completed using drilling rigs.

3. **Offshore Development**: The installation stage consists of the use of marine assets to transport, install, hook-up and commission offshore infrastructure.

4. **Life of Field**: Once production commences all subsequent expenditure is considered operational and includes the maintenance and operation of offshore infrastructure.

5. **Decommissioning**: The decommissioning stage involves the removal and disposal of an offshore installation when it’s no longer needed for its intended use.

**Vessel Definition**

1. **Offshore Support Vessels** – OSVs are used in a variety of roles throughout the lifecycle of an offshore development and can be further divided into three main vessel types.

2. **MODU** – MODUs are used for both exploration, developmental drilling and in some instances, well intervention work. These offshore drilling rigs are either anchored to the seabed or dynamically positioned.

3. **Construction Vessels** – These vessels are used extensively during the field development stage and can be further divided into SURF & Pipelay's, Subsea and Conventional Construction Vessels.

4. **Floating production units** - This refers to offshore units that are involved in the production and storage of oil & gas.

5. **WTIV** - Wind construction vessels are mainly exposed to the renewables market and have a different set of market drivers as compared to other vessel types.
1. **North Sea** – not governed by a set of local content requirements, although there has been an added emphasis on environmental and safety issues.

2. **North America** – No explicit local content requirements for offshore vessel construction, however, a variety of regulations govern offshore vessels that can be operated within the US:
   a. US Coast Guard (USCG)
   b. Mineral Management Service (MMS)
   c. Jones Act

3. **Africa** - The shipbuilding industry in Africa is currently going through major changes as the region struggles to meet local demand (mainly in the oil & gas industry)
   - South Africa - Revised Preferential Procurement Policy Framework Act (PPPFA) regulations for Shipbuilding
   - Current local content have a focus on Production Units

**Local Content Cont.**

1. **Latin America** – Brazil has introduced several local content requirements in an attempt to strengthen the local industry
   - While local content policies are in place, the local industry struggles to meet Petrobras’ ambitious E&P plans

2. **Middle East** – No explicit regulations regarding the construction of offshore vessels.
   - Historically, contractors in the region have acquired vessels from both Western and Asian yards.

3. **Asia** - There are no explicit construction local content requirements governing Asian countries, however, local content policies on vessel contracting exists.
   - Indonesia – Requires all drilling vessels to be Indonesian-flagged
   - Malaysia – Petroleum Development Act and Petroleum regulations require supplies and service providers to have a valid license produced by Petronas (NOC of Malaysia)
Vessel Newbuild Requirements

- Total vessels required over the 2014-2025 period ranges from 1229 units to 1964 units.
Historical Orders and Shipyard Capacity

Historical Shipbuilding Activities

- Historically, OECD shipyards have averaged 71% utilisation over the 2000-2014 period with a peak in 2006-2010 where utilisation reached 93%.

- Offshore vessels saw an accounted for 11.3% of total CGT, an increase from 6% due to an increasing offshore market coupled with a slowing marine shipbuilding market.

- OECD yards have been losing market share to non-OECD yards mainly due to lower cost of construction and favourable financing terms.

OECD Yard Capabilities

- Based on maximum CGT of each yard, 34% of OECD offshore yards are able to construct production units such as FPSOs and 48% have sufficient yard capacity to produce drillships.

- The vast majority of yards (96%) are able to produce smaller, less complicated vessels such as OSVs.

- It may be important to note that this matrix does not take into account other key factors such as engineering capabilities, EPC capabilities and other commercial factors.
The AHTS market is driven by a combination of large assets supporting deepwater drilling and smaller multi-purpose service vessels.

The PSV market is expected to see the strongest growth out of all OSV types as a result of increased demand for floating production systems and drillships.

Typically, the crewboat/ERRV market is less subjected to industry cyclicality given the greater exposure to longer term life of field contracts and a relatively consolidated supply chain. With the exception of the largest vessels, the majority of construction activity is highly localised.

Significant growth is expected in the shallow water jackup drilling market before a plateau between 2020-2025. The market is also trending towards larger 400ft and above rated units.

The semisub market is driven by deepwater demand in harsh operating environments such as the North Sea, Latin America and Australasia.

Demand for drillships is expected to see robust growth, driven by the deepwater triangle – West Africa, Latin America and North America.
**FPU Demand**

- Demand for FPSOs globally is expected to increase by 60% - 262 units by 2025
- Demand for FPSS globally is expected to increase by 34% - 281 units by 2025
- Global demand for SPARs is expected to increase by 50% - 27 units by 2025
- Demand for TLP globally is expected to increase by 75% - 39 units by 2025
- Global demand for FSOs is expected to increase by 10% – 90 units by 2025

**Key Points**

- The FPSO market is predominantly project-driven with an additional 129 units expected over the 2014-2025 period. An additional 12 FPSS may be required over the forecast period.
- SPAR additions will mainly be deployed in the North American market. A US-centric market will continue to see regional yards supplying topsides with European yards taking up hull contracts.
- Due to the project-driven nature of these production units, DW does not expect any clear trends in terms of specifications on TLPs.
- Asian yards are expected to continue supplying FSOs due to relatively lower engineering requirements.

**Construction Vessel Demand**

- The subsea vessels market is expected to grow by 176% - 54,000 days in 2025
- The SURF & Pipelay vessels market is expected to grow by 62% - 40,000 days in 2025
- Demand for construction vessels is expected to decrease by 14% - 11,000 days in 2025
- Demand for barges globally is expected to increase 35% - 39,000 days in 2025
- Demand for wind construction vessels is expected to double – 55,000 days in 2025

**Key Points**

- Driven by an increasing volume of subsea installations coupled with a high volume of IRM activities, DW expect demand for subsea vessels to see robust growth particularly from Latin America and Africa.
- SURF vessels are expected to enjoy higher growth due to an increasing volume of subsea installations particularly in Africa and Latin America. Convention pipelay demand from the Middle East and Asia.
- Key offshore construction specifications include larger crane capacity due to larger offshore platforms.
- Asia is expected to dominate accommodation barge supply over the forecast.
- Increasing water depth and size of wind turbines is expected to drive higher requirements for larger cranes and deeper operational capabilities.
Over the 2014-2025 forecast period, demand for all vessel types is expected to increase by 3.7% CAGR.

Historical supply and building activities have experienced two distinct build cycles. The first cycle marked the advancement of the global offshore oil & gas industry, which led to a spike in offshore construction.

The last decade has seen higher building activity, driven by both a high oil price environment and a need for fleet replacement.
Summary & Conclusions

### Current Fleet Size

<table>
<thead>
<tr>
<th>Current Fleet Size</th>
<th>2014 – 2025 CAGR</th>
<th>Vessels Required</th>
<th>Upside Potential – High Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crewboats/RRV</td>
<td>1,159</td>
<td>160</td>
<td>350</td>
</tr>
<tr>
<td>AHTS</td>
<td>2,779</td>
<td>465</td>
<td>670</td>
</tr>
<tr>
<td>PSV</td>
<td>1,819</td>
<td>170</td>
<td>350</td>
</tr>
<tr>
<td>Jackup</td>
<td>508</td>
<td>40</td>
<td>140</td>
</tr>
<tr>
<td>Semi-Submersible</td>
<td>221</td>
<td>50</td>
<td>80</td>
</tr>
<tr>
<td>Drillship</td>
<td>97</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Barriers To Entry

- Less technically complex
- Proximity of yards is a key criteria
- Larger AHTS require high level of technical capability
- <8,000 HP very price competitive
- Larger PSVs require high level of technical capability
- <2,000 HP very price competitive
- Track record and lead time critical
- Favourable financing terms & lower costs have enabled Chinese yards to secure market share
- Drillships are the most challenging/build
- Drillship market is dominated by 3 Korean yards – Singaporean yards easing into this market (i.e. Keppel)
- Singaporean yards dominate
- Technical capabilities and track record critical – cost pressures mitigate this
- Significant range in vessel quality
- Barges are very price competitive
- Top tier yards secure heavy-lift contracts
- Significant range in vessel quality
- Barges are very price competitive
- Top tier yards secure high specification vessel contracts
- Not high tech vessels
- Emerging market – significant Chinese presence (55% of newbuilds)
- Yard EPC capabilities critical
- Turnkey projects awarded to yards
- Top tier yards - engineering capability

### Summary & Conclusions

- Western contractors tend to favour western yards – Asian and Middle East contractors are more cost conscious
- Lack of IP regulations
Conclusions

• Underlying macro fundamentals are supportive of continued growth in demand for oil & gas.

• Positive macro outlook gives a favourable indication towards the requirement for additional offshore infrastructure.

• Robust growth forecast for both the OSV and MODU market is expected over the next decade, supported by increasing offshore drilling activities.

• An increase of 3.3% CAGR for OSVs and 4.8% CAGR for MODUs are expected till 2025. This growth is largely attributed to the increase in activity in Latin America, Africa and Asia.

• DW expects growth in the FPU market given the increase in offshore production activity.

• Besides subsea and SURF vessels, the requirement for construction vessels will be driven by the replacement market.

• Wind construction vessels is expected to grow rapidly with continued government subsidies. However, strong Chinese presence.

Any Questions?